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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/706,350 | 11/03/2000 | James F. Bredt | Z00837006 GSE | 6314 |

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GOODWIN PROCTER LLP
PATENT ADMINISTRATOR
EXCHANGE PLACE
BOSTON, MA 02109-2881

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| EXAMINER |
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MAKI, STEVEN D

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| ART UNIT | PAPER NUMBER |
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1733

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/706,350

Applicant(s)

BREDT ET AL.

Examiner

Steven D. Maki

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004 and 06 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 21-42, 55-60, 73-77, 85-105, 112 and 115-126 is/are pending in the application.
- 4a) Of the above claim(s) 1-11, 21-42, 55-60, 73-77, 99-105, 112 and 115-123 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 85-98 and 124-126 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 061104.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Decision on Petition to Correct Inventorship under 37 CFR 1.48

1) In view of the papers filed 1-3-02 and 4-23-04, it has been found that this nonprovisional application, as filed, through error and without deceptive intent, improperly set forth the inventorship, and accordingly, this application has been corrected in compliance with 37 CFR 1.48(a). The inventorship of this application has been changed by adding Matthew DiCologero and the 102(f) rejection set forth in the last office action has been withdrawn.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of Office records to reflect the inventorship as corrected.

2) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3) Claim 125 and 126 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 126, the description of "the cationic reactant is an anionically reactant starch" (emphasis added) is confusing. In claim 126, should "the cationic reactant" be -- the anionic reactant--?

As to claims 125 and 126, it is unclear if the limitation in claim 86 of at least one of the reactants being soluble in the fluid is being removed.

4) Claims 125 and 126 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Art Unit: 1733

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 125 and 126 describe cationically reactant starch and anionically reactant starch. The original disclosure describes cationically reactant starch and anionically reactant starch as being examples of insoluble cationic polyelectrolyte and insoluble anionic reactants. See page 10 and table 1 on page 27. Claims 125 and 126 are each indirectly dependent on claim 86, which requires at least one of the reactants to be soluble in the fluid. Claims 125 and 126 remove this requirement (broaden claim 86) and thereby fail to further limit.

5) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Bredt et al 031

7) Claims 91, 93, 95 and 97 are rejected under 35 U.S.C. 102(e) as being anticipated by Bredt et al 031 (US 2001/0050031).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claims 85-90, 92, 94, 96, 98 and 124-126 of this application are entitled to the benefit of the filing date of applicant's provisional application 60/164,000 filed 11-5-99.

However, claims 91, 93, 95 and 97 are not entitled to the benefit of the filing date of applicant's provisional 60/164,000 filed 11-5-99 because provisional 60/164,000 fails to describe each of the members of the Markush group in claims 91, 93, 95 and 97. Provisional application 60/164,000 fails for example to describe "polybutylaminoethyl methacrylate", "polyvinyl pyridine" and "ammonium salt of polyvinylsulfonic acid". Accordingly, the earliest filing date claims 91, 93, 95 and 97 are entitled to is 11-3-00.

Bredt et al 031, which claims benefit to 60/197118 filed 4-14-00, describes "sodium polystyrene sulfonate" and "polyethyleneimine". See paragraphs 23 and 24. These two reactants are also described on page 17 of provisional 60/197,118

Since Bredt et al 031 has a different inventive entity than this application and the filing date 4-14-00 is before the filing date 11-3-00, Bredt et al 031 is available as prior art under 35 USC 102(e) against claims 91, 93, 95 and 97.

Claims 91, 93, 95 and 97 are anticipated by Bredt et al 031. See at least paragraphs 23 and 24.

Van Der Geest

8) Claims 85-90, 92, 94, 96, 98 and 124-126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Geest (WO 98/51477) in view of Clark et al (US 4476190), or Japan 683 (JP 3-287683) and Nagai et al (US 5096491).

WO 98/51477 corresponds to US 6403002 cited by applicant in the IDS filed 6-11-04.

Van der Geest substantially discloses the claimed invention except that Van der Geest does not specifically recite that the binder comprises "first reactant" and "second reactant". However, it would have been obvious to one of ordinary skill in the art to provide Van der Geest's binder as a "free-flowing particulate material comprising a first reactant and a second reactant" as claimed in view of (1) Van der Geest's teaching that the binder *for the "method of 3-D printing"* may be **wallpaper adhesive powder** (page 4) and (2) (a) Clarke et al's teaching of an **adhesive for wallpaper** comprising anionic particles and cationic particles or (b) Japan 683's teaching of an **adhesive for wallpaper** comprising starch powder wherein Nagai et al teaches that starch adhesive may comprise a mixture of cationic starch and anionic starch (col. 2 lines 23-54).

Bredt et al 798

9) **Claims 85-90, 92-94, 96-98 and 124-126 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bredt et al 798 (WO 98/09798).**

Bredt et al 798 discloses a method of three dimensional printing comprising:

- (1) providing a first layer of a mixture of particles;
- (2) dispensing a fluid onto a first region of the first layer and the first region being contiguous with a second region comprising the mixture of particles;
- (3) allowing a solidified material to form in the first region;
- (4) providing a second layer of the mixture of particles over the first layer; and
- (5) dispensing a fluid onto a first region of the second layer.

The mixture of particles comprise particles of adhesive, particles of filler and optionally a fibrous component. The fluid activates the adhesive causing the particles to adhere together and to adhere to the previously formed adjacent layers. See page 4 lines 22-23. At page 6 line 31 to page 7 line 1, Bredt et al 798 describes the adhesive as defining a component that forms the primary adhesive bonds in the mixture of material between portions of the mixture that were separate prior to activation by an activating fluid. At page 8 line 27, Bredt et al 798 describes the activated particles as adhering together. At page 9, Bredt et al 798 describes forming adhesive bonds between the filler and the fiber. At page 9 lines 8-9, Bredt et al 798 teaches that the adhesive bonds harden, joining the filler and, optionally fiber particulates into a rigid structure. At page 11, Bredt et al 798 describes the filler particles becoming adhesively bonded together. Bredt et al 798 describes the **adhesive** at page 10 line 10 to page 11 line 4. Bredt et al 798 describes the **filler** at page 7 lines 1-3 and page 11 line 5 to line 15. Bredt et al 798 teaches "Compounds suitable for use as the filler of the present invention can be selected from the same general groups from which the adhesive is selected ..." (page 11 lines 60-17). Bredt et al 798 describes the **fibrous component** at page 7 lines 6-8 and page 11 line 22 to page 12 line 3. Bredt et al 798 describes the **fluid** at page 12 line 26 to page 13 line 2. In the example in Table 1, the adhesive is sucrose (sugar) and the filler is maltodextrin (starch).

As to claim 85, the claimed method is anticipated by Bredt et al 798's method of three-dimensional printing. Claim 85 describes "a reaction". At page 7 lines 24-26, the original disclosure broadly defines "Chemically react" as resulting "... in the dissociation

Art Unit: 1733

and/or formation of chemical bonds such as covalent bonds, ionic bonds, ionic interactions, hydrogen bonding interactions, and the like". In claim 85, the claimed first reactant reads on the adhesive, filler or fiber and the claimed second reactant reads on the adhesive, filler or fiber. For example, the first reactant reads on the adhesive and the second reactant reads on the filler. The step of "allowing a reaction between the first and second reactants to occur" is sufficiently broad to read on the adhering of particles described by Bredt et al 798. For example, the claimed reaction read on the formation of "adhesive bonds" between the adhesive particles and the filler particles. The mixture of particles is a free-flowing particulate. In any event: it would have been obvious to provide Bredt et al 798's mixture for providing the layers as a "free-flowing particle material comprising a first reactant and a second reactant" since Bredt et al 798 teaches that the mixture comprises a mixture of adhesive particles, filler particles and optionally fibrous component wherein (a) the mixture is described as being a "powder" (page 6 line 21), the adhesive is preferably milled as finely as possible prior to admixture with the filler (page 10 lines 15-16), the filler includes a distribution of particle grain sizes ranging from 20 to 200 micrometers (page 11 lines 10-12) and the fibrous component has a mean length of about 60 to 200 micrometers (claim 27 on page 17).

As to the dependent claims: As to claim 86, the adhesive has "highly solubility", the filler may be "sparingly soluble" (page 11 line 8) and the fiber may be "substantially slower dissolving than the adhesive" (page 11 line 23). As to claims 87-90, 90-94 and 96-98, see the materials disclosed by Bredt et al 798 for the adhesive and filler. For example, Bredt et al teaches that the adhesive may be starch or polyacrylic acid and

Art Unit: 1733

that the filler may be starch. As claim 124, the claimed "inert" material reads on the fibrous component.

10) **Claims 85-98 and 124-126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bredt et al 798 (WO 98/09798) in view of Keegan et al (US 3926870), Nagai et al (US 5096491) or Thuresson (US 6077887) and optionally in view of Earl et al (US 5943235).**

Bredt et al 798, which is discussed above, is considered to anticipate claim 85. In any event: it would have been obvious to one of ordinary skill in the art to use a first particulate reactant and a second particulate reactant (as required by claim 85) in the mixture of particles used in Bredt et al's three dimensional printing method since (1) Bredt et al, *directed to three dimensional printing / prototyping*, teaches that the **one component particulate material** is activated by the fluid so as to become adhesive and that, as the fluid dissolves the adhesive, the fluid viscosity increases dramatically arresting further migration of the fluid from the initial point of impact (page 9 lines 2-4) and (2) (a) **two component particulate material comprising two reactants (cationic material and anionic material)**, which is activated by fluid so as to become adhesive, is a well known type of adhesive material in the adhesive bonding art as evidenced for example by Keegan et al or Nagai et al or (b) Thuresson teaches using **water soluble anionic polyelectrolyte and water soluble cationic polyelectrolyte** as a thickening agent so as to obtain an unexpectedly high viscosity increase (col. 6 lines 25-29) and optionally (3) Earl et al, *also directed to three dimensional printing / prototyping*, suggests **using reactive material (one part epoxy or two part epoxy)** in a three

Art Unit: 1733

dimensional printing method (col. 5 line 40 to col. 6 line 60). Hence, Bredt et al 798 teaches using water activated particulate adhesive in the 3-D printing method and known water activated particulate adhesives comprise first reactant and second reactant as evidenced by Keegen et al or Nagai et al. Bredt et al 798 also teaches that the viscosity of the fluid should increase dramatically after the fluid is applied to the mixture of particles and Thuresson suggests using a first reactant and a second reactant to obtain unexpectedly high viscosity increase. Thuresson also specifically describes anionic material such as copolymers of methacrylic acid with methyl methacrylate and cationic material such as poly(diallyldimethylammonium chloride) (col. 1). Earl et al (optionally applied) adds to the teachings of Bredt et al 798 by suggesting that "reactive" material may be used in a composition for 3-D printing. No unexpected results over the above applied prior art has been shown.

Remarks

11) Applicant's arguments with respect to claims 85-98 and 124-126 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 4-23-04 have been fully considered but they are not persuasive; it being noted that Bredt et al 798 teaches a method for forming a three dimensional printing using known fluid activated particulate material as the adhesive wherein known adhesives include fluid activated particulate material comprising a first and second reactant as evidence by Keegen et al or Nagai et al. The suggestion to look to the adhesive art for an adhesive comprising particles which are activated by fluid is found in Bredt et al instead of the secondary art to Keegan et al or Nagai et al. Earl et

Art Unit: 1733

al, now optionally applied, continues to suggest that two component reactive material is an alternative to one component material. The suggestion to activate the material is found in Bredt et al 798.


12) No claim is allowed.

13) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven D. Maki
July 24, 2005


STEVEN D. MAKI
PRIMARY EXAMINER
~~GROUP 1300~~
Av 1733
7-24-05